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THE INJURIOUS INFLUENCES OF THE SCHOOLS.

PART II.

CONGESTIONS OF BLOOD TO THE HEAD.

IN the preceding section, it has been said that the leaning-over position of the head calls forth congestions. This is explained in the following manner:

Through the bending of the neck, those blood-vessels of the latter which should bring back the blood from the head to the breast, are compressed. Close fitting articles of clothing favor in a high degree such pressure; other circumstances have a similar effect. With a bowed-over position of the head there occurs, naturally, a proportionate bending of the chest, the more so, the lower is the plate of the desk. The result of this is a certain pressing together of the stomach, and this again on its part results in a hindering of the activity of the diaphragm, the most powerful of the muscles of inspiration. Imperfect inspiration prevents the reflux of the blood from the veins of the neck to the breast, whither it should return.

To this must be added the fact, that, with strained attention, inspiration is performed more imperfectly, the more so the less the need for respiration is incited by talking. The necessity felt after a certain time for inhaling a deep breath,

after long, temperate, and especially quiet straining of the mind, is thus explained, and in the case of weak or tired persons, the inclination to yawn appears as the natural form of the deepest inspiration. All these circumstances favor the so-called passive or mechanical congestion, in so far as they prevent the reflux of the blood in the veins.

There is, however, in the schools, a very effective cause for the so-called *active* congestions to the head, that is, for the increased flow of blood through the arteries, and that is, the strained activity of the brain. From the relation of the brain to the nerve centers, this organ can produce not only an increased activity of the heart, but a widening of the arteries, which is made evident by an increased flow of blood to the head. Reddening of the face, ears, and eyes, are the immediate signs of this, although it is known that in the case of higher excitement, the opposite, paleness of countenance sometimes occurs, caused by the prolonged contraction and narrowing of the blood-vessels. This external paleness, which is not seldom connected with a strong reddening of the ears, by no means proves a similar paleness of the brain. The latter can indeed be very full of blood, while the cheeks are blanched.

Among the various evils which result from these in part passive and in part active congestions, three have given, of late years, the opportunity for statistical inquiries. Drs. Guillaume and Becker report the following:—

I. HEADACHE.—Guillaume, who designates this disease as *Cephalalgic scolaire*, found among 731 scholars of the "College Municipal" in Neufchatel, 296, or over forty per cent., who suffered frequently from headache (*Hygiène scolaire*. Genève, 1864, pp. 33, 77.) Girls were found to be more liable to it than boys. Among the latter were only twenty-eight per cent. The younger pupils, especially among the boys, suffered to a very great degree. Becker (*Luft und Bewegung zur Gesundheitspflege in den Schulen*. Frankfort-on-the-Main, 1867, p. 12,) examined 3,564 scholars, boys and girls, of all the public schools of Darmstadt and Bessungen, as well as three private schools at Darmstadt. He found 974, or 27.3 per cent. suffering, more or less, from headache. The

special tables are, unfortunately, imperfectly communicated, only the percentage and not the real figures, being given. The result of the examination, however, appears to be, that in the city schools, in regard to the boys, the lower classes contain the greater number of sufferers; while in the higher schools (gymnasias, higher girls' schools) it is just the upper classes that furnish a very strong contingent. In the first class of the gymnasium, 80.8 per cent. complained of headache. Becker concludes from his figures (which do not exactly agree) that the number of sufferers is least in the first-school years, and increases with the length of school visitation, the greater number of hours of study, and the intellectual strain required. As another agency, he mentions the school rooms of too small dimensions.

It must nevertheless be mentioned that another circumstance can come into account. Deville and Troost (*Compt. rend. des séances de l'acad. des sciences*. 1868, 13 January,) found in the air of school rooms, various gases, especially carbonic oxide, generated by red, glowing, iron stoves, a circumstance which is not rarely met with in schools. Headaches, dizziness, tremblings, and similar attacks are also the consequence of the slighter effects of that so poisonous gas. Dr. Oidtmann (*Der Kohldendunst in seiner giftigen Wirkung auf den menschlichen Körper*, Linnich, 1868, p. 62,) has no hesitation in asserting that chronic poisoning of school children through carbonic oxide, in his own district, where iron stoves are very common, is relatively of very frequent occurrence.

II. BLEEDING OF THE NOSE.—Guillaume found bleeding of the nose frequently occurring; with 155 pupils—twenty-one per cent.! He found the evil more general with boys (twenty-two per cent.) than with girls (twenty per cent.) Among the boys a very decided decrease was shown in the upper classes; among the girls this decrease was less regular. Becker found on the whole only 405, or eleven and three-tenths per cent. afflicted with bleeding of the nose. Exact figures are not given, though he says that the bleeding was most frequent in the upper classes of the gymnasium, the higher girls' school, and one private school; in

those schools, as he says, whose pupils sit longest in the school room, and have the least exercise in the open air.

III. GOITRE.—Guillaume, who, as far as my knowledge reaches, was the first to refer to this disease, designates it as *school-goitre*, (*goitre-scolaire*,) and says it was known among the scholars themselves by the name of "thick neck," (*gros cou*.) He found 414 cases, or fifty-six per cent. ; 169, or forty-eight per cent. among the boys, and 245, or sixty-four per cent. among the girls. According to this author, goitre frequently disappears during the holidays, becoming chronic at a later period, but showing itself as early as the eighth year among school girls, after a single year's visitation of the school. In regard to this disease, the statements of Guillaume stand as yet isolated, and it is questionable, therefore, if they may lay claim to a general validity. Nevertheless, it is certain that the feminine sex and the age of youth in general, are especially predisposed to goitre ; and that through distention of the glandular vessels the basis for this evil can be produced. (See, for more extended information on this point, Virchow's *Onkologie*, Vol. III, pp. 21, 52, 76.) This point deserves a more minute medical research, because the evil in question, having a certain duration, the diseased organ can be examined closely, and positive results might be expected.

Headache and bleeding of the nose, on the other hand, are evils sufficiently known to physicians and parents as frequent concomitants to school visitation. Here, too, the experiences cited by no means lead us to a safe conclusion. It is rather to be urged that, in future, teachers should keep, under medical supervision, lists of cases of these evils occurring, and the data thus won should be compared with the conditions of the school room, of the individual classes, the time devoted to instruction, the seasons of the year, the character of the stoves, and the ventilation. Nevertheless, it can hardly be admitted, even with our present knowledge, that the schools favor such abnormal phenomena to a very great extent, and it is probable that, in many cases, the schools are the first to call them out ; and their frequent appearance must be made the subject of earnest reflection.

At this point we would speak concerning the influences of congestive conditions upon the intellectual capacities of the scholar. It cannot be doubted that such conditions are frequently connected with distraction of the mind and incapacity for thought and intellectual labor: and that, when they become permanent, dangerous symptoms of the brain are thereby developed. Certain physicians have tried to make the schools responsible for the appearance of epilepsy, St. Vitus' dance, and other diseases of the mind, manifesting themselves at a later period. F. Heyer *Ueber die allzu grosse Anstrengung der körperlichen und geistigen Kräfte im Kindes- und Jünglingsalter*, Berlin, 1864,) sharply emphasizes this point. But the connection of the facts is here very loose. In order to gain a scientific basis, we need thorough preliminary examinations, and it must here suffice merely to indicate in a general way the presence of a danger, which in individual cases first of all comes to prominence, when special lacks or bases prevent a positive point of attack to the working causes. According to the points of view adopted by the researcher, now this lack or basis, now that momentary cause, would gain a greater importance; and it is very plain that just here the method of instruction, the especial influence and treatment on the part of the teacher, comes very essentially into consideration.

IV. CURVATURES OF THE SPINE.—Not a few medical men who have engaged in special studies upon the question of diseases of the school, hold firmly to the opinion that a great portion of the charge of producing curvatures of the spine must be laid to the school. Especially is the lateral curvature, and indeed, here again, chiefly the habitual form, laid to its charge. Fahrner *Das Kind und der Schultisch*, Zurich, 1865, p. 6,) says: "If nearly ninety per cent. of these curvatures begin during the school-age, and the curvature corresponds exactly with the position taken in writing, we have certainly the right to complain that the school is the principal cause of this evil." Guillaume makes a comparison of the usual form of lateral curvature, with the position taken in writing by a correct illustration, and he says, that among 731 pupils, he found 218, therefore nearly thirty per cent., who exhibited deviations of the spine.

That the majority of cases of lateral curvature arise during the school years, is a view unanimously adopted by all orthopedists. Klopsch (*Orthopädische Studien und Erfahrungen*, Breslau, 1861, p. 22,) embraces the experiences of medical specialists in saying, that the majority of cases arise between the tenth and fourteenth years. Eulenburg alone assumes an earlier period. He formerly placed it between the seventh and twelfth years, but later between the sixth and tenth. At any rate, all agree in placing the origin of the disease in the period of the school-age. It can be confidently asserted, that the ordinary lateral curvature of the spine is a *development-disease of the school-age*.

It is less certain whether the school, as such, is the principal cause of this disease. On the one hand we here lack comparisons with countries where school visitation is not obligatory. The testimony of the primary school committee of New York, which Guillaume gives, has a certain value, although it is not conclusive. On the other hand, a comparison of many schools would be here necessary: the discrepancies between Eulenburg and other orthopedists would then possibly be explained.

An especial consideration against accusing the schools of producing this disease might arise from the fact that lateral curvature preponderates among females. Guillaume counted among 350 boys 62 cases, or eighteen per cent. of scoliotic (with lateral curvature), and among 381 girls 156 cases, or forty-one per cent.! But many slight cases are here included, which, from a pathological stand-point, do not come into consideration. The experiences of orthopedists relating to very severe cases are much more striking. Klopsch calculates that from eighty-four to eighty-nine per cent. of all cases of lateral curvature fall upon the female sex. Adams (*Lectures on the Pathology and Treatment of Lateral and other Forms of Curvature of the Spine*, London, 1865, p. 149.) has calculated that of 173 cases, 151 were feminine, and only 22 masculine; Knorr (*Erster Bericht der gymn. orthop. und elektrischen Heilanstalt in München*, 1860, p. 23,) in 72 cases, 60 feminine.

According to these figures, it cannot be doubted that the school is not the only cause of lateral curvature; indeed, it

must be also acknowledged that it is not the principal cause, for experience has proved, although we have not the figures here, that lateral curvature appears very frequently among girls who do not visit the school at all. Orthopedists have often referred to other kinds of employment, especially feminine hand-work, as a weighty cause of curvature. If this be correct, then the home and the family sin just as much as the school, and in many cases more. Nevertheless, the latter cannot be declared innocent; otherwise the same argument could be reversed, and applied to short-sightedness, which appears excessively frequent among boys. If then, from the facts previously adduced, it is proved that the study of books injures mostly the eyes of the boys, and the feminine hand-work more the back and chest of the girls, there arises a very distinct duty for the schools, which should also give an example for employment at home.

Some Orthopedists, as Bouvier, (*Leçons cliniques sur les maladies chroniques de l'appareil locomoteur*, Paris, 1858, p. 427,) refuses to charge hardly any influence to the employment and the posture, in the production of lateral curvature; but we have positive experience which necessarily compels us to such an assumption; and that is, the very preponderating appearance of the rectilinear division of the spine. We will adduce a few figures. Adams, for instance, found among 742 cases of simple curvature, 619 in which the convexity of the spine was to the right. This is just the posture described by Guillaume, which applies naturally to drawing, feminine hand-work, etc. Such a coincidence cannot possibly be accidental. Nor can the usual curvature be traced to a specially diseased condition. Parow reports, in a lecture on the necessity for improvement in the form of the school-desk, that he had observed among 282 cases of curvature, 218, or about seventy-nine per cent. in which there was no special external or internal diseased condition that could be referred to as the cause of this evil. The origin must be alone attributed to an incorrect position of the body, which had become a habit.

It does not indeed follow that the curvature of the spine is a mere muscular effect, as many orthopedists have assumed; it is certain that the bones of the spine are subject to

positive changes, which assume more and more permanent form. These changes appear *during growth*, at a period when the spine itself is in its development. They give abnormal forms of the vertebræ; alter their relative positions; are transmitted also to the bones of the chest and the pelvis and even to the face, (Stern in *Müller's Archiv*, 1834, p. 238,) and thereby have certain effects upon the organs inclosed in those parts. In this relation it may suffice to call to mind, that, according to the spirometrical measurements of Schildbach, (*Beobachtungen und Betrachtungen über die Skoliose*, Amsterdam, 1862, p. 7,) among children from thirteen to fifteen years of age, afflicted with curvature, the capacity for inhalation had decreased a third, and, in some cases, one-half; in other words, that the respiration which is the first necessity to a healthy life, is injured to the very greatest degree.

As regards the minute developments of the process of curvature great diversity of opinion exists among physicans. While Klopsch considers, as the primal point of exit for the disturbance, the bones of the pelvis, the disproportionate formation of which first produces the deviation in the lower part of the spine; Hüter, (*Die Formentwicklung am Skelet des menschlichen Thorax*. Leipzig, 1865, p. 87,) exactly to the contrary, regards lateral curvature to be the asymmetrical development of the halves of the chest. But this diversity of opinion, which probably proceeds from a too great generalization of correct observations, does not exclude the possibility, that in either case an improper posture and one-sided activity of the muscles is the primary cause, which produces one-sided pressure upon the growing parts, and thereby retards the growth of the bones and one side of the body.

In the cases reported by Klopsch, imperfect growth of the bones around the back cartilaginous seam of the pelvis (Synchondrosis sacro-iliaca) is first of all treated. The fact is, however, that the body when seated in the position taken for writing rests very frequently and for a length of time upon the left hip; and it is very natural that the left capulary seam should also be pressed together to a greater extent. Probably we should here bring to mind still another

circumstance, which the experienced orthopedist, Schildbach, has adduced for another end (*Virchow's Archiv*, 1867.) He calls attention to the fact, that girls frequently sit in such a manner that their clothes are all pressed together under one hip. "The benches in the school are generally placed in such a position that the window is found at the left side, and on the right is the doorway. The girls, therefore, proceed to their places with the left side first, between the benches and the desk, and when they come to sit down, under the left half of the seat they have the clothes smoothly folded under them, while under the right half, these are doubly, and trebly folded, making a difference of from one to two inches in height."

If, on the other hand, we have to consider as Hüter has correctly adduced, for the majority of cases, a primary misformation of the one-half of the chest, we must then again return to the pressure which falls upon one side of the bodies of the vertebræ to an excessive degree. This pressure, however, is induced through a lateral curvature, which must first of all be referred to muscular activity. What now is the reason that the curvature of the pectoral spine is generally to the right? At the close of a very conscientious research, Hermann Mayer says in *Virchow's Archiv*, 1866, vol. XXXV, p. 251: "We find the cause in the carriage, which arises from the endeavor to place the right shoulder as high as possible—an effort which is called forth by the use of high desks, lathes, etc.; further, in the attitude produced by the inclination of the head to the left side, in order to look upon the course of the pen; in short, in various oblique positions, frequently repeated, and arising from various causes. Meanwhile, the muscles must not, therefore, be accused of developing lateral curvatures, for the muscles producing such carriage do not immediately bring on the attitudes and changes of the form by direct action, they merely give through the act once performed, the faulty attitude, and this acts onward in conjunction with the statical momenta."

In a more recent essay, which treats especially the question of the school desks, Mayer declares very positively (in *Virchow's Archiv*, 1867, vol. XXXVIII,) that high desks,

which are at too great a distance from the scholar, favor the development of lateral curvature, and he recommends a change of the forms of the benches and desks. Prince (*Orthopedics*, Philadelphia, 1866, p. 100,) calls attention to the fact, how much compulsory quiet and sitting still contributes in growing children towards commencing and confirming improper postures, a remark which certainly deserves to be noticed by teachers in girls' schools.

From a consideration of the evils already discussed, there arises, at all events, for the school a very well defined duty. On the one hand, scholars, and especially girls, must be seated in a judicious manner, and be carefully overlooked as to their carriage and posture, and, on the other hand, they must be given opportunities, by proper gymnastic exercises, of bringing their limbs again into proper use.

V. DISEASES OF THE ORGANS OF THE CHEST.—Among diseases of the organs contained in the cavity of the chest it has been especially those of the organs of respiration which have been charged as being caused by unsuitable arrangement of the desks and benches in the schools. Among these diseases, again, pulmonary consumption, mostly in connection with scrofula, has been especially named. Lorinser in particular mentions this subject in his aforementioned article; and Carmichael reiterates the charge. The latter relates, among other things, that, in a parochial school which was in a courtyard, and, in which, therefore, the children were compelled to remain the whole of the time, out of twenty-four well nourished and well clothed girls, who showed no traces of disease on first entering the school, seven were found to be scrofulous. Arnott was commissioned with the examination of a boys' school at Norwood, England, among the scholars of which (six hundred in number) scrofula was uncommonly spread, and an excessive mortality prevailed. The evil was generally ascribed to improper and insufficient nourishment. Arnott, nevertheless, found that the food was good, and given in sufficient quantities; but that the ventilation was almost totally neglected. After this latter evil had been remedied, the excess of scrofula quickly disappeared (M'Cormac, *On the Nature, Treatment, and Prevention*

of *Pulmonary Consumption*, London, 1855, p. 480;—Ancell, *A Treatise on Tuberculosis*, London, 1852, p. 445;—Benj. W. Richardson, *The Hygienic Treatment of Pulmonary Consumption*, London, 1857, p. 13). A number of similar examples could be adduced, though here, too, statistical data is wanting. Only indirectly do we win single facts in favor of the correctness of the view that school attendance favors consumption. We possess for Berlin, for example, regular statistical tables, arranged according to age and manner of death (Engel, *Die Sterblichkeit und Lebenserwartung im preuss. Staate und besonders in Berlin*, 1863, p. 96-97), from which, by selecting the deaths of the school-age, we find a rapid increase of the rate of mortality from pulmonary and bronchial consumption in the period including the tenth to the fifteenth years of age, and increasing to a considerable extent in the later period from the fifteenth to the twentieth years. Of one hundred cases of death in the ages from

5-10 years	4.81	were from pulmonary consumption.
10-15	" 12.96	" "
15-20	" 31.88	" "

To this should be added 8.93, 7.90, and 4.74 per cent. cases of scrofula not included in the above, besides many other closely related categories. This result is certainly very striking, especially when it is considered that, besides the diseases noted, only typhus and cholera cause an approximate high rate of mortality among these ages.

Of course this mortality cannot be ascribed to school visitation alone: many conditions of home life have a positive influence upon it. Nevertheless, the fact is not to be underrated, that the schools contribute a great deal toward it. As especially injurious the following influences are to be specially noted:—

1. Air rendered impure by the stay of so many children in the school rooms.
2. Colds, brought on by the change from the warm schools to the cold air, and the draughts through windows, doors, etc., which induce inflammations of the neck and of the organs of the chest.
3. Dust in the school room.

4. The organs of respiration impaired by continual sitting.

To a very recent date the opinions regarding the cause of pulmonary consumption were unclear and contradictory. This disease was confused with tuberculosis and thereby transferred, without known cause, to the department of hereditary constitutional diseases. More recent researches have taught that, in the designation of pulmonary consumption, a greater number of different processes are included, which sometimes exist simultaneously, or succeed one another; at other times exist singly and independently. Many of them, though by no means all, lead in later stages to ulceration of the lungs. The majority of them begin with simple catarrhic and inflammatory symptoms, which generally owe their origin to external influences, especially to the taking of cold, and the inspiration of irritating materials such as dust, ashes, etc. Their duration is favored by imperfect respiratory movements, causing accumulation and retaining of the secretory matter; and further, through the viscosity and perishableness of this secretory matter, which decomposes and inspissates, and upon whose condition the nature of the air inspired has an influence not less, indeed, even more, than the character of the nourishment; and finally, through the duration or repetition of the irritative influences.

This brief survey will suffice to show how dangerous to health a school with bad arrangements and imperfect oversight can be, and how much reason there is to fear that a portion of the fatal cases of consumption of the school-age may really be attributed to the agency of the school as such; indeed, that even a part of the unfavorable symptoms which appear after the school period is passed, may also be attributed to the school. There is nothing so frequent among school children as coughs and pains of the neck. Vernois, in his report on the hygienic condition of the French lyceums (*Etat hygienique des lycées de l'empire en 1867, Paris, 1868, p. 20.*) places angina and bronchitis at the head of all diseases observed. By the non-attention to these evils in the case of a sickly child, a very dangerous process can result. There is therefore reason enough for earnest care.

DISEASES OF THE ORGANS OF DIGESTION.

Much as people were inclined earlier, to ascribe constipation of the bowels and the supposed increase and prematurity of the hemorrhoid to the school, this whole department is, nevertheless, insecure. We do not wish it to be here understood that there is no reason for apprehension. But it is, very difficult to win here a safe basis, since the most of these diseases are not fatal, and are therefore exempt from statistical elucidation; and as other injurious influences, especially the nourishment, are so frequently present, the degree of injury which may in these cases be ascribed to the school, as such, is difficult to determine. How much an improper posture in sitting injures the circulation in the stomach is evident; but we cannot tell how great are the permanent injuries resulting therefrom to liver, stomach, spleen, kidneys, etc. Only two departments can be here treated from the stand-point of experience.

The first includes the organs of digestion. We can refer to the fact here that the continuous attendance of school very frequently injures the appetite, so that, after some weeks, or at least after some months, periods of loss of appetite, dyspepsia, and similar complaints make their appearance, with more and more frequency. Irregularity in going to the stool, imperfect preparation of the blood, debility, fatigue, emaciation, and loathing of food are the usual consequences.

Dr. Gast (in his *Aerztliche Vorschläge zur Reform des Volksschulwesens in Sachsen*, Leipzig, 1863, p. 7.) has with justice called special attention to these phenomena; lack of ventilation in the school rooms, lack of proper exercise, intellectual over-exertion are the causes first to be mentioned. The increase of the period of attendance at school, and even the increase of the numbers of hours of instruction in the forenoon in favor of the free afternoon, contribute towards increasing these abnormal conditions.

The second section relates to the sexual organs, which, with both sexes, in the later periods of attendance at the public schools, and still more, in the higher schools, are so much exposed to danger. Apart from the evil influences of

bad example, and leading astray, the long continued sitting, intellectual excitement, and the existence of disturbances of the organs of digestion, easily irritate the sexual organs. The greatest attention should be paid to this subject in girls' schools, where the menstrual period of those growing up into womanhood is a consideration calling for so much care. This point is competently treated of by Gast, in his work above-mentioned, and it may here suffice to refer the reader to it. The necessity of experienced female teachers, or at least feminine oversight, for girls' schools, is too frequently neglected.

CONTAGIOUS DISEASES.

Certain contagious diseases, as measles and scarlet fever, are so well-known as preëminently diseases of children, and disseminated by the school, that it suffices here merely to bring them to mind. It is not to be doubted that there are other diseases, such as the small-pox, cholera, whooping-cough, and diptheria, which find in the school a fresh starting point for increase. Typhus and diarrhœa here come less under consideration, for although cases can be adduced where in consequence of drinking impure water, such diseases appeared epidemical, these are exceptional, and are seen most in boarding schools. The transferral of parasitical plants and animals, (itch, lice, scurf,) may be mentioned here for the sake of completeness. With reference to physical injuries received from the punishments of the teacher, those from the scholars fighting with one another, and also from gymnastics, no statistics exist, but that such injuries do occur from all these causes, is undeniable, and indicate the great necessity for careful superintendence and thought by school teachers.

CONCLUSION.

When we survey the facts here given, we see a great want of scientifically confirmed, numerically authenticated, and, consequently, perfectly reliable material. It is possible that more extended information might be obtained from the official reports of the school authorities; perhaps there is some existing in literature not mentioned here. But however much is necessary yet to be won for completion, it is

undoubtedly certain that an exact compendium of school pathology does not exist. Such, however, must necessarily be determined if the school authorities are to go safely to work. Until now it has been attained only in a few places, and indeed we may say only for shortsightedness; and here only through the private labors of single physicians. The public school authorities must, therefore, see that they gain a perfect knowledge of the pathological school diseases. This might in part be attained through the teachers, if it were determined that they should complete the "absence list," by noting the cases of sickness and death, in a book specially designed for the purpose; this, however, is more a preparatory work rather than the labor proper.

The latter can only be performed by physicians; physicians, too, who are well acquainted with school-hygiene and the modern methods of research. It is an indispensable necessity that the public health in the schools, with all necessary appurtenances, be put into the hands of competent physicians. They must first determine the dangers by which the school-age is threatened; from the summing up of their reports they will come to an exact result in regard to the school diseases of the whole country, and the separate provinces. From this may be gained the data for an exact knowledge of the corporeal development of the nation.

Another point, the question of school desks and benches, may also here be touched upon. If desks and benches are to stand in a certain relation to the body of the young, then more extended measurements of the size and proportion of the bodies of the children and young people must be made, than have hitherto been done. It will not suffice to choose here and there a large town. It is necessary to put town and country in a certain contrast, and, above all, to take into account the provincial peculiarities. The same ages in a class in one part of the country show quite a different average size to those of another. Manufacturing districts give far different proportions to the agricultural districts. How great this difference is in the age of childhood is not known, at least so far as figures go, on the basis of which the models for the size and proportion of bench and desk should be taken. That there would be no difficulty in carry-

ing these researches to a greater extent is shown by the example of a number of physicians who have already voluntarily undertaken such tasks. We desire that such examinations should be carried on officially on a fixed method. How weighty the result would be is self-evident.

Only after such preparatory labors will it be possible to discuss further, in a comprehensive manner, in what relation certain diseases stand to certain arrangements and regulations found in the school. In order to draw positive results, a CENTRAL COMMISSION OF SCHOOLMEN AND PHYSICIANS should be formed, which should take in hand the direction of the whole matter. As a matter of course these men would have to discuss these measures and regulations which later would serve as the tenor for the issuing of laws or instructions.

The overwatching and in part carrying out of these measures and regulations must again be conferred upon a Committee in each school district, in which, as permanent member, there should be a sanitary officer, or in the greater districts, several such.

It is not likely that a more precise research will direct attention to new and hitherto unknown injurious influences and causes of disease. Their number can now be pretty correctly determined. They are principally the following:

1. *Air in the school-room*; the condition of which is affected by the size of the room, the number of scholars, heating, ventilation, dampness of the floor and walls, and dust (cleanliness).
2. *Light in the school-room*; affected by the position of the building and the room, the size of the windows and their relation to the desks, the color of the walls and the surroundings, and artificial illumination, (gas, oil, etc.)
3. *Seats in the school-room*; especially the relation of bench and desk, formation of the same, and length of time seated.
4. *Bodily exercises*; especially playing, gymnastics, bathing, and their relation to the time of sitting and purely intellectual work; their arrangement and oversight.
5. *Intellectual exercises*; their duration and change; their amount; the arrangement and duration of the play hours

and holidays; the amount of home and school labor; the commencement of school duties, etc.

6. *Punishment*; especially corporeal.

7. *Drinking-water*.

8. *Water-closet*.

9. *Means employed in instruction*; especially the choice of books (size of print), and the objects employed in intuitive instruction.

Of late years reformatory movements have been begun in certain of the German schools, especially in regard to the bench and desk question. And though it must be admitted that this question is of great importance, that short-sightedness, congestions to the head, difficulties of respiration, improper posture of the spinal column must be referred to improper benches and desks, to a degree which is not to be under-estimated, it is, nevertheless, not to be denied, that these articles alone do not bear all the blame. Insufficient light, wrong position of the windows, improper attitudes, too small print of the school books, too small handwriting, have greater or less influence in bringing on and increasing short-sightedness. Bad air, imperfect ventilation, overfilling of the class-rooms, carbonic oxide from the stoves, over-exertion of the brain, produce congestions, even with the best forms of benches and desks. Often enough a number of causes are at work, and their total effect must not be ascribed to any single one.

The sanitary official alone is able to deal with the cases here mentioned. He will be able to give all the necessary information to the school authorities, and to give his propositions for changes. As a matter of course, there are many questions of a purely pedagogic nature. What demands are to be placed upon the ability of the scholar, what exertions can be undergone according to his age, what method of instruction shall be applied, how the hours for gymnastics, play, and the holidays shall be fixed, is first of all a matter belonging to the school-man, but a greater part of these questions will only be properly solved when here, too, the advice of the physician is submitted. In the School Commission an exchange of opinions must be had, school-men and physicians mutually explaining to, and convincing each

other. Only in the working together of those persons perfectly acquainted with the subject will the State and the community win a suitable organization for school oversight which can overwatch the solving of one of the great problems of the times—the physical and intellectual health and development of the coming generation.

GEOGRAPHICAL NOTES.

UNITED STATES.—Four American exploring expeditions are now in the field, viz., those of Clarence King (40th parallel) and Lieutenant Wheeler (Nevada and Arizona), under the auspices of the War Department; Professor Hayden (Montana and Idaho), Interior Department; and Major Powell (on the Colorado), Smithsonian Institution. Perhaps the most thoroughly equipped and elaborate exploration is that of Lieut. Wheeler, which has for its object a thorough investigation of the region west of the hundredth meridian, for the purpose of determining its geographical positions, thoroughly working out its topography, and investigating its geology, natural history, and climatology. As the basis of this work, it is proposed by Lieut. Wheeler to divide the region referred to into eighty-five rectangles of equal size, and to mark their corners with great precision, then, taking each one in detail, to determine its astronomical, physical, and natural history features. Eight rectangles have been completed by Lieut. Wheeler in his previous expeditions, and it is expected that thirteen will be finished by the end of the season.

“The work of the present season will be carried on almost simultaneously in Utah, Arizona, and Nevada, several divisions of the main party having already been organized and set to work. The southern and south-western portions of the Salt Lake basin are to be explored; also the mining regions of Eastern Nevada. It is proposed to establish astronomical points, by means of which to determine with greater accuracy the location of the mineral veins. The Wasatch Mountains will constitute the eastern limit of operations during the year. The expedition, as organized, embraces the following among the more important of the *personnel*:—Lieut. George M. Wheeler, United States Engineers, in command; Lieuts. R. L. Hoxie

and W. L. Marshall, U. S. Engineers; Dr. H. C. Yarrow, surgeon and naturalist; T. V. Brown, hospital steward and meteorologist; G. K. Gilbert and E. E. Howell, geologists; J. H. Clark and E. P. Austin, astronomical observers; Louis Nell and John E. Weyss, chief topographers; H. W. Henshaw, assistant naturalists; M. S. Severance, ethnologist; and William Bell, photographer."—*Harper's Weekly*.

—The San Juan boundary dispute, after years of assertion on one side and refusal to yield on the other, has at last been settled in favor of the United States by Emperor William of Germany, who rendered his decision in October. Much smaller differences than this have brought about great wars. The question between England and this country was whether the Haro channel east of Vancouver Island, or the Rosario Strait near the main, was the true water boundary between the two empires. It is now resolved in favor of the outer strait, with the result of establishing our sovereignty over San Juan Island, Orcas Island, Lopez Island, and a number of others less significant, which constitute the little archipelago lying between the Georgia Straits and the Straits of Juan de Fuca.

BRITISH AMERICA.—What is our gain (Columbia's) is British Columbia's loss. An interesting account of this languid and unenterprising colony, though rich in natural resources, is given in the last report of the Minister of Public Works of the Dominion of Canada. Speaking of the Chinook jargon which had its cradle there—the *lingua franca* of the New World—he says that it is based on French, English, and certain Indian tongues, among which is that of the Chililts or Chinooks, who live in the southern part of Columbia, and that it is indispensable in all commercial dealings with the natives. The French article is attached to the noun as an integral part, as in *labouti* (*bouteille*, bottle). The letter *r* is changed into *l*, as in *lablid* (*bride*, bridle); or is elided altogether, as in *lapouchete* (*fourchette*, fork), *lemahto* (*marteau*, hammer), *lesouk* (*sucré*, sugar). Very often the French noun is undisguised except by the incorporation of the definite article as in the examples given. Nor is the English without its witness. *Sun* is the Chinook expression for the day; a cascade is *tumwater*, and *house* and *bed* are in good repute with their proper meaning. Indian words

prevail, and include the numerals. Imitation words, as *tintin* for a bell and all kinds of musical instruments, are also observable. An American is called *Boston*—a reminiscence of the early ventures of the merchants of that city to the Oregon coast; an Englishman *King George*; and a Frenchman *Passiouk*, a corruption of his true designation, *Français*.

SOUTH AMERICA.—Three centuries before the passage of the Cape of Good Hope had been made there was a dye-wood known in Europe under the name of *bresill*, *brasy*, *brasilly*, *bresilji*, *braxilis*, and *brasile*, and derived from India. This name began to be assumed for Brazil in the first part of the 16th century (in an official document first in 1530.) Till then the country had been called Terra de Sancta Cruz.

ASIA.—The *entente cordiale* between Russia and the Khan of Khiva has not lasted long. The latter is determined to submit to Muscovite aggrandizement only as his peers of Khokan and Bokhara have done—after the supreme test of battle. Three Russian columns have been directed against him, from Karakool and two other points; and the result will soon be known.

OCEANICA.—The first news despatch from Australia to New York, by the Overland Telegraph and cables, was sent October 24 and printed in the morning papers here on October 26. This telegraph promises to be for Australia what the Pacific Railroad is to our Far West—the pioneer of discovery, settlement, and development. Since 1860-63, the period of Burke's and Stuart's and Mackinlay's attempts, more or less successful, to traverse the continent from north to south, there has been a lull in exploration. Already, however, in May of this year, upon the extension of the telegraph in the track of these hardy explorers, an expedition was undertaken from Mount Freeling (about $23\frac{1}{2}^{\circ}$ South lat., 133° East long.) to Perth, on the south-west coast. The leader was a Mr. Giles, and his course takes him through an absolutely unknown expanse of a thousand miles. Mr. A. G. Burt, while engaged in laying the Overland Telegraph, discovered a broad sheet of fresh water which he christened "Wood's Lake," to the west of Ashburton Range, in 18° South latitude.

—Some idea of the rapid growth of the settled portions of Australia may be had from the following table, copied from No. 39 of the Journal of the Berlin Geographical Society (p. 268):

	Males.	Females.	Total.
Census of May 12, 1836....	142	35	177
" Nov. 8, 1836....	186	38	224
" Sept. 12, 1839....	3,080	431	3,511
" Mar. 2, 1841....	8,274	3,464	11,738
" Mar. 2, 1846....	20,184	12,695	32,879
" Mar. 2, 1851....	46,202	31,143	77,345
" April 20, 1854....	155,895	80,903	236,798
" Mar. 29, 1857....	264,334	146,432	410,766
" April 7, 1861....	328,651	211,671	540,322
" April 2, 1871....	400,252	329,402	729,654

The last census showed 17,813 Chinese, of whom only 43 were women; and 859 aborigines. The population of Melbourne proper was 55,798; with its suburbs, 193,698. The city of Ballarat was next in population: 40,651.

—According to the Sydney *Herald*, the schooner *Surprise* has lately made a visit to the coast of New Guinea, penetrating fifteen miles up the Manoa River. Contrary to the general impression, the natives, who were hitherto supposed to be ferocious in their character and opposed to the visits of strangers, were found to be mild and gentle in disposition. They were of the Malay stock, and had never seen white people before. On the departure of the schooner, under Captain Paget, they exhibited every demonstration of sorrow, the women weeping and the men accompanying the party to a considerable distance.—(*Nature*.) A Russian savant, by name Michlucho-Maclay, has devoted his life and fortune to the exploration of this interesting island, and when last heard from, in September, 1871, was established in a block-house on the north-east coast, somewhere between Humboldt Bay and the Louisiade Archipelago. His only companions are a Swedish sailor and a Polynesian, and he should by this time have begun his advance into the interior.

—In her recent exchanges of territory with Great Britain, Holland surrendered New Guinea and acquired full possession of Sumatra, and she has begun to extend a network of telegraphs over the whole island, and to build railroads across the plains. The elephant manifests a strong dis-

like to the telegraph poles, as, in the neighboring island of Java, do the buffalo and the rhinoceros.

—The exact population of the Philippine islands will not be ascertainable for a long time, as in all the islands there exist independent tribes. 1,232,544 inhabitants pay tribute to the Government, and are divided among 43 provinces and 933 villages. From them the total population is estimated at 7,451,352. Of these, 4,467, 111 are found in Luzon, in 508 villages; and 191,802 in Mindanao.

—The Fiji group of islands, 120 in number, is inhabited by about one hundred and fifty thousand of the darker of the two Polynesian races, and about three thousand Europeans, whose numbers are rapidly increasing. These islands have been the theater of missionary enterprise for forty or fifty years, and some sixty thousand of the natives are enrolled as members of the English Methodist Church, which has ten or twelve white missionaries on the islands, besides native helpers. It is remarkable that a special impulse to this civilization was given in 1855 by Commander Burtwell, of the American navy, in demanding from the king indemnity to the amount of \$45,000 for injuries done to American property by the natives. Unable to raise this amount, King Thakombau offered to accept the authority of England and declare his kingdom a province of the British empire, on condition of the payment of the indemnity fund. England, however, had begun to find colonies an expensive luxury, and hence she declined the offer. Meanwhile a company of capitalists was formed at Melbourne for the purpose of colonizing these islands and trading with them. On condition of paying the American indemnity they were granted two hundred thousand acres of land. Immigration began to increase, and several very profitable branches of agriculture were instituted. The exports are cotton, coffee, wool, cocoa-nut oil, dried cocoa, tropical fruits, ornamental woods, etc. Cotton, however, is likely to become the leading article of shipment and culture. Dr. Isaac M. Brower, formerly American Consul, gave a great impulse to this branch of production by introducing the seed of the Sea-Island cotton, which now produces the finest cotton in the world. It sells in Europe at from three to five shillings sterling per pound.

It is largely used in the silk manufactories of France in mixed silk fabrics. In Fiji the cotton plant is a perennial shrub, not requiring to be replanted oftener than every five or six years. A glance at the mercatorial map of the world will show the Fiji islands on nearly a direct line between San Francisco and Melbourne.—(*Washington Chronicle*.) Thakombau was the king or *tui* of Bau, and the colonists whom he summoned in have not been content to acknowledge his sovereignty without the guarantees of a written constitution. They set up one, ineffectually, in 1867, and another, with great solemnity, in 1871, June 5. This last is almost an exact copy of the Sandwich Islands constitution. On the 25th of July, 1871, Thakombau became the recognized head of the entire archipelago.

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Periodical Literature.—*American Naturalist* for September and October: "On the Geology of the Island of Aquidneck [or Rhode Island]"—two highly important papers by Prof. N. S. Shaler.

—Captain Burton has returned from his explorations in Iceland and deposited his collections and papers with the Anthropological Institute, London, being obliged to repair at once to Trieste to take the place of the late Charles Lever as British Consul at that port.—*Nature*, Sept. 26.

Cartography.—The Hereford (Eng.) Mappa Mundi has just been published in fac-simile. This remarkable map of the world, drawn on thick vellum and mounted on oak (53 inches by 63), was discovered about a century ago under the floor of Bishop Audley's Chapel. The name of the author (Richard of Holdingham and Sleaford in Lincolnshire) was revealed by certain metrical lines, in Norman French, in one of its corners. It was executed between 1290 and 1310. The

mediævalists believed that three philosophers, Nichodoxus, Theodotus, and Polictus, were sent out by Augustus Cæsar at the birth of our Lord to survey the world, and all maps like these show the supposed results of their observation. The emperor is shown in this map giving the philosophers their credentials. The earth is represented as a circular island with the ocean flowing round it; Jerusalem is in the centre, and the other most-distinctly shown cities are Babylon, Rome, and Troy. The editors of the fac-simile, in a prospectus, observe—"This arrangement is common to most of the mediæval maps of the world, but the Hereford Map is distinguished from the rest by its great size, its elaborate drawing, its illustrations of objects in natural history and of historical facts, and its numerous inscriptions, many of which are of great interest in an archæological point of view. It may be regarded as the most complete representation in existence of those speculative notions of our forefathers regarding the earth, which speedily gave way upon the advance of actual geographical knowledge in the fifteenth century."—*Athenæum*, September 14.

—Adolph Stieler's Hand-Atlas, Part IX., (New York: L. W. Schmidt) gives the first of six plates which will embrace the whole of the United States. The present one contains all the region west of 107° and north of 39° to the Pacific Coast. "Yellowstone National Park" is boldly inscribed in the right place, showing to how late a date the map is brought down. No cheaper outlay can be made than to procure this set of six maps for \$3.00, including twelve other first-class maps of various parts of the world. A little enterprise on the part of teachers, and liberality on the part of school-committees, would cause such opportunities to be improved without delay.

THE RIVER NILE.

THE bed of the Nile, like that of the lower Mississippi, is higher than the valley through which it passes. Warburton said: "The Nile's bed is a sort of savings-bank, by means of which the deposits of four thousand years have enabled him to rise in the world and run along a causeway of his own." It is the only river in the world which runs upward of twelve hundred miles, in undiminished volume, without a tributary stream. It moves on its long course without the help of even a creek, tapped by innumerable canals and thirsty gardens with which it is fringed, absorbed by hot sand banks and hotter sun, and empties greater bulk at its mouths than it has between the cataracts. The products of Egypt are the gifts of this stream. The lands on which the towns and hamlets of Egypt repose is foreign soil, brought from the far south by this public carrier. For more than four thousand years he has faithfully brought his burden and deposited it at the feet of Egypt. The Rameses and the Ptolemies come and go, and the Nile remains unchanged.

ELEMENTARY EDUCATION.

TO those persons who are accustomed to consider our colleges as the inner sanctuary of all learning, and those brave youths of ours who succeed in entering their august portals as far beyond the need of rudimental instruction, the statements of Professor Tyler, of the University of Michigan, in regard to the orthographic performances of some of the students of that institution will no doubt seem startling.

"Here," he says, "are a few gems which I found glittering in essays written by Sophomores: 'axidental,' 'wrot iron,' 'meny,' 'scientiffic,' 'tital,' 'imoral creachers,' 'opper-tunities,' 'lucretive,' 'merchantile,' 'the vast pararies of the west,' 'togather,' 'has to pas,' 'perhapse.'"

And again, he says: "One year I had the curiosity to see what I could collect of this kind from the speeches carefully prepared for Junior Exhibition by members of the classical section of the class, then in the third year of its course; and this was the luck I had: 'ageant,' 'unintelligable,' 'contrairy,' 'plausable,' 'Cipio Africanus,' 'clowd of darkness,' 'faverite.' I will add that the samples now given were taken from the writings of students who have been since graduated; but that the supply is still apparently as abundant as ever."

When we remember that the University of Michigan ranks among our half dozen best colleges, such disclosures as the foregoing are mortifying to our national vanity. Even when we take into consideration the fact that these orthographic curiosities were, in all probability, taken from the productions of the lowest scholars of junior classes, they still remain a rather heavy drawback upon the spread-eagle style of talk about our educational institutions, in which Americans have been known to indulge.

What have we a right to infer from such revelations, in regard to the public and private schools which have sent, and continue to send, young men to college so lamentably deficient in things which boys in their jackets should blush not to know? Are not our schools, as in fact we are in most matters, in too great a hurry? Too eager for Latin

and Greek to give time and attention to the very elements of our own language? Our children are in many cases allowed to escape much too early, not only from their spelling books, but from their Geographies and Grammars. No sooner have they learned to read with some fluency, and obtained a slight smattering of these elementary branches, than they suddenly begin to shoot forward on a sort of mental velocipede into more advanced studies, skimming so lightly over the intermediate ground that it is nearly impossible for them to gain more than a meagre knowledge of the landmarks.

Another great obstacle in the way of the thorough elementary education of our children is, we think, the senseless habits of study which many of them are allowed to contract. We have frequently noticed studious children "pegging" away as if for dear life at a lesson, repeating the same thing over and over, perhaps twenty times in succession, but in a thoughtless, mechanical way which prevented their gaining the knowledge of the subject which two or three times careful reading would have given them.

And again, unless children are peculiarly bright and eager to understand "what it's all about," they will frequently study, if allowed to do so, with about as clear a comprehension of what they are trying to learn as we expect them to have of the precession of the equinoxes. We have in mind a youth of fourteen, to whose recitation in arithmetic we once listened. On being asked the question, "For what is cubic measure used?" the answer being "For measuring solid bodies," the poor deluded youth replied promptly, and as though rather proud of knowing his lesson so well, "For measuring souls and bodies."

This is doubtless an exaggerated case (though we have heard of others almost as absurd), but it will serve, we think, as a striking illustration of the necessity which exists for teaching our children *how* to study.

D. D.

KNOWLEDGE will soon become folly, when good sense ceases to be its guardian.

WHAT KNOWLEDGE IS OF MOST WORTH?

XI.—STUDIES BEST ADAPTED FOR DISCIPLINE.

THUS far our question has been, the worth of knowledge of this or that kind for purposes of guidance. We have now to judge the relative values of different kinds of knowledge for purposes of discipline. This division of our subject we are obliged to treat with comparative brevity; and happily, no very lengthened treatment of it is needed. Having found what is best for the one end, we have by implication found what is best for the other. We may be quite sure that the acquirement of those classes of facts which are most useful for regulating conduct, involves a mental exercise best fitted for strengthening the faculties. It would be utterly contrary to the beautiful economy of Nature, if one kind of culture were needed for the gaining of information and another kind were needed as a mental gymnastic. Everywhere throughout creation we find faculties developed through the performance of those functions which it is their office to perform; not through the performance of artificial exercises devised to fit them for these functions. The Red Indian acquires the swiftness and agility which make him a successful hunter, by the actual pursuit of animals; and by the miscellaneous activities of his life, he gains a better balance of physical powers than gymnastics ever give. That skill in tracking enemies and prey which he has reached by long practice, implies a subtlety of perception far exceeding anything produced by artificial training. And similarly throughout. From the Bushman, whose eye, which being habitually employed in identifying distant objects that are to be pursued or fled from, has acquired a quite telescopic range, to the accountant whose daily practice enables him to add up several columns of figures simultaneously, we find that the highest power of a faculty results from the discharge of those duties which the conditions of life require it to discharge. And we may be certain, *à priori*, that the same law holds throughout education. The education of most value for guidance, must at the

same time be the education of most value for discipline. Let us consider the evidence.

One advantage claimed for that devotion to language-learning which forms so prominent a feature in the ordinary *curriculum*, is, that the memory is thereby strengthened. And it is apparently assumed that this is an advantage peculiar to the study of words. But the truth is, that the sciences afford far wider fields for the exercise of memory. It is no slight task to remember all the facts ascertained respecting our solar system ; much more to remember all that is known concerning the structure of our galaxy. The new compounds which chemistry daily accumulates, are so numerous that few, save professors, know the names of them all ; and to recollect the atomic constitutions and affinities of all these compounds, is scarcely possible without making chemistry the occupation of life. In the enormous mass of phenomena presented by the Earth's crust, and in the still more enormous mass of phenomena presented by the fossils it contains, there is matter which it takes the geological student years of application to master. In each leading division of physics—sound, heat, light, electricity—the facts are numerous enough to alarm any one proposing to learn them all. And when we pass to the organic sciences, the effort of memory required becomes still greater. In human anatomy alone, the quantity of detail is so great, that the young surgeon has commonly to get it up half-a-dozen times before he can permanently retain it. The number of species of plants which botanists distinguish, amounts to some 320,000 ; while the varied forms of animal life with which the zoologist deals, are estimated at some two millions. So vast is the accumulation of facts which men of science have before them, that only by dividing and subdividing their labors can they deal with it. To a complete knowledge of his own division, each adds but a general knowledge of the rest. Surely, then, science, cultivated even to a very moderate extent, affords adequate exercise for memory. To say the very least, it involves quite as good a training for this faculty as language does.

But now mark that while for the training of mere memory, science is as good as, if not better than, language ; it has an

immense superiority in the kind of memory it cultivates. In the acquirement of a language, the connections of ideas to be established in the mind correspond to facts that are in great measure accidental ; whereas, in the acquirement of science, the connections of ideas to be established in the mind correspond to facts that are mostly necessary. It is true that the relations of words to their meaning is in one sense natural, and that the genesis of these relations may be traced back a certain distance ; though very rarely to the beginning ; (to which let us add the remark that the laws of this genesis form a branch of mental science—the science of philology.) But since it will not be contended that in the acquisition of languages, as ordinarily carried on, these natural relations between words and their meanings are habitually traced, and the laws regulating them explained ; it must be admitted that they are commonly learned as fortuitous relations. On the other hand, the relations which science presents are casual relations ; and, when properly taught, are understood as such. Instead of being practically accidental, they are necessary ; and as such, give exercise to the reasoning faculties. While language familiarizes with non-rational relations, science familiarizes with rational relations. While the one exercises memory only, the other exercises both memory and understanding.

Observe next that a great superiority of science over language as a means of discipline, is, that it cultivates the judgment. As, in a lecture on mental education delivered at the Royal Institution, Professor Faraday well remarks, the most common intellectual fault is deficiency of judgment. He contends that “ society, speaking generally, is not only ignorant as respects education of the judgment, but it is also ignorant of its ignorance.” And the cause to which he ascribes this state is want of scientific culture. The truth of his conclusion is obvious. Correct judgment with regard to all surrounding things, events, and consequences, becomes possible only through knowledge of the way in which surrounding phenomena depend on each other. No extent of acquaintance with the meaning of words, can give the power of forming correct inferences respecting causes and effects. The constant habit of drawing conclusions from data, and

then of verifying those conclusions by observation and experiment, can alone give the power of judging correctly. And that it necessitates this habit is one of the immense advantages of science.

Not only, however, for intellectual discipline is science the best; but also for *moral* discipline. The learning of languages tends, if anything, further to increase the already undue respect for authority. Such and such are the meanings of these words, says the teacher or the dictionary. So and so is the rule in this case, says the grammar. By the pupil these dicta are received as unquestionable. His constant attitude of mind is that of submission to dogmatic teaching. And a necessary result is a tendency to accept without inquiry whatever is established. Quite opposite is the attitude of mind generated by the cultivation of science. By science, constant appeal is made to individual reason. Its truths are not accepted upon authority alone; but all are at liberty to test them—nay, in many cases, the pupil is required to think out his own conclusions. Every step in a scientific investigation is submitted to his judgment. He is not asked to admit it without seeing it to be true. And the trust in his own powers thus produced, is further increased by the constancy with which Nature justifies his conclusions when they are correctly drawn. From all which there flows that independence which is a most valuable element in character. Nor is this the only moral benefit bequeathed by scientific culture. When carried on, as it should always be, as much as possible under the form of independent research, it exercises perseverance and sincerity. As says Professor Tyndall of inductive inquiry, "it requires patient industry, and an humble and conscientious acceptance of what Nature reveals. The first condition of success is an honest receptivity and a willingness to abandon all preconceived notions, however cherished, if they be found to contradict the truth. Believe me, a self-renunciation which has something noble in it, and of which the world never hears, is often exacted in the private experience of the true votary of science."—*Herbert Spencer.*

FUNCTIONS OF THE BRAIN.

IF the manifestations of the brain's functions were the earliest to attract the attention of philosophers, they will assuredly be the last to receive explanation from physiologists. We believe that the progress of modern science allows us now to approach the subject of the physiology of the brain; but, before beginning the study of the cerebral functions, we must clearly understand our point of departure. In this essay, we have attempted to state only one term of the problem, and to show how untenable is the opinion that the brain forms an exception in the organism, and is the *substratum* of intelligence instead of being its instrument. This idea is not only an absolute conception, but an unscientific one, injurious to the progress of physiology and psychology. Indeed, what sense is there in the notion that any apparatus of Nature, whether in its lifeless or its living domain, can be the seat of a phenomenon without being its instrument? Preconceived ideas clearly have a great influence in discussing the functions of the brain, and a solution is combated by arguments used for the sake of their tendency. Some refuse to allow that the brain can be the organ of intelligence, from fear of being involved by that admission in materialistic doctrines; while others eagerly and arbitrarily lodge intelligence in a round of fusiform nerve-cells, for fear of being charged with spiritualism. For ourselves, we are not concerned about such fears. Physiology tells us that, except in the difference and the greater complexity of the phenomena, the brain is the organ of intelligence in exactly the same way that the heart is the organ of circulation, and the larynx that of the voice. We discover everywhere a necessary bond between the organs and their functions; it is a general principle, from which no organ of the body can escape. Physiology should copy the example of more advanced sciences, and free itself from the fetters of philosophy that would impede its progress; its mission is to seek truth calmly and confidently, its object is to establish it beyond doubt or charge, without any alarm as to the form under which it may make its appearance.—
Claude Bernard, in Popular Science Monthly.

ANCIENT ENGINEERING AMONG THE CHINESE.

THE most remarkable evidence of the mechanical science and skill of the Chinese so far back as 1,600 years ago is to be found in their suspended bridges, the invention of which is assigned to the Han dynasty. According to the concurrent testimony of all their historical and geographical writers, Sangleang, the commander of the army under Baou-tsoo, the first of the Hans, undertook and completed the formation of the roads through the mountainous province of Shense, to the west of the capital. Hitherto its lofty hills and deep valleys had rendered the communication difficult and circuitous. With a body of one hundred thousand laborers he cut passages over the mountains, throwing the removed soil into valleys, and, where this was not sufficient to raise the road to the required height, he constructed bridges which rested on pillars or abutments. In another place he conceived and accomplished the daring project of suspending a bridge from one mountain to another across a deep chasm. These bridges, which were called by the Chinese writers, very appropriately, flying bridges, and represented to be numerous at the present day, are sometimes so high that they cannot be traversed without alarm. One still existing in Shense stretches four hundred feet from mountain to mountain, over a chasm of five hundred feet. Most of these flying bridges are so wide that four horsemen can ride on them abreast, and balustrades are placed on each side to protect travelers. It is by no means improbable (as M. Panthier suggests), as the missionaries to China made known the fact more than a century ago that the Chinese had suspended bridges, that the ideas may have been taken thence for similar construction by European engineers.—*Popular Science Monthly.*

CARDINAL WOLSEY, one of the greatest ministers of state that ever was, poured forth his soul in these sad words—
“Had I been as diligent to serve my God, as I have been to please my king, he would not have forsaken me now in my grey hairs.”

EDUCATION IN ENGLAND.

WORKING OF THE EDUCATIONAL SYSTEM IN LONDON.

TWO years ago we were all rejoicing over what we rather presumptuously called the settlement of the National Education question. Although the scheme then carried through Parliament was avowedly a compromise, it was considered to be one which would be supported by an overwhelming majority. Setting aside the few bigots who insisted upon secular education pure and simple, and the few bigots who would have none but an exclusively clerical scheme of education, it was hoped that we should all agree to work the machinery as energetically as possible, and then all kinds of desirable results would follow. All the neglected population of our streets would be forced into familiarity with the three Rs. England would, like Prussia, be thoroughly drilled into education. The schools provided by the official boards and the schools provided by the various denominations would coöperate harmoniously, and there would be at worst a sufficient degree of emulation to stimulate all persons concerned to the fullest exertion of their energy. These roseate expectations, like most others of the kind, have been doomed to disappointment. If not altogether abandoned, we are compelled to admit that the day of realization is further off than we had originally supposed, and that, in short, we had immensely underrated the extraordinary difficulty of the task which lies before us.

Thus, for example, in London a controversy has recently arisen which strikingly illustrates the various perplexities which are not yet cleared up. In the early days of enthusiasm, men of unusual distinction allowed themselves to be nominated for the board. Lord Lawrence and Prof. Huxley—to mention no others—were amongst the first members, though both of them have since been compelled to retire from ill health. The debates of the board were anxiously watched, and it was hoped that we should speedily witness unmistakable results of their labors. The debates, however, prolonged themselves after the fashion of most parliamen-

tary performances, and a certain degree of impatience began to be manifested. Most people became rather tired of watching the course of affairs, and we had sunk into comparative indifference, when, at last, the board, having made elaborate preparations for its campaign against ignorance, began decidedly to take the field. New schools are being built; some have actually come into operation; and an attempt has been made to put in force the provisions for compulsory education. A certain number of previously neglected children have been forced into the schools. Straightway there arises a sudden shock of indignation, showing that jealousies which were supposed to be extinct are still in full force, and that the whole battle, which occupied Parliament for a session, is to be fought over again in the petty parliament of the school-boards; and that questions which Parliament evaded by committing their decision to the local bodies, are now pressing for a solution. The immediate cause of the explosion occurred at certain schools in the North of London. The visitors appointed by the board had succeeded in sending to a school already established some thirty children, who had hitherto been completely neglected. Well, one might have thought, here was a cause for rejoicing. The school would certainly welcome these little outcasts, at any rate, if their fees could be paid by the school-board. On the contrary, the children were summarily dismissed, and the managers of the school were indignant at the burden thrust upon them. Their reason was that these unfortunates belonged to the class variously designated as "waifs and strays," "street Arabs," or "gutter-children." They were poor little hangers-on upon the lowest fringe of society, who had learnt the worst of language if they had learnt nothing else, whose clothing was not even decent, and who were suspected of bringing with them physical as well as moral contagion. They were therefore received much as a sweep would be received in a first-class railway carriage. If you force these children to school, it was urged, you ought to provide a separate place for them. There are lines of demarcation amongst the London poor just as deep and wide as those which separate the aristocracy and the middle-classes. The child of the decently-clad artisan alto-

gether refuses to be mixed up with the child of the poor beggar or crossing-sweeper. The spirit of caste, in short, raises difficulties as great as those raised by the spirit of religious bigotry.

But other complications speedily arose. The school-board naturally does not wish to open the doors of the new schools to this social refuse. It desires to make its own education a model; if its system is to be weighted by having all the refuse, a slur will be thrown upon it, and it will not be able to compete on equal terms with the denominational schools. There is nothing, it may be, which the denominational schools would like better. If the schools founded by the board are left empty, the advocates of the old system declare them to be useless; if they are filled, the same persons maintain that they are filled by draining the old schools, and that no real addition is made to the educational resources of the country. The representatives of the denominational party on the board are strongly inclined to hamper its efforts in every way that occurs, in order to prevent its competing effectually with the schools now established. The clergy, indeed, all over the country look askance upon school-boards generally, and are only too ready to denounce them as useless and expensive incumbrances. Meanwhile, if the board tries to set up an inferior class of schools for the poorest children, in order to draft them off from the better schools, it meets with a new set of difficulties. In the first place, there is the obvious difficulty of enforcing a system to which Englishmen are so little accustomed, and especially of enforcing it in the case of children whose earnings form a considerable part of the resources of the family. If a boy picks up a few pence a day by selling newspapers or matches, and you force him into school, it may be that his family will not be able to support him. And thus arise all kinds of delicate questions, which the board is scarcely able to answer. They have no sufficient machinery for deciding upon the degree of poverty of the parents and of knowing whether or not they can afford to pay school-pence, or afford even to be deprived of the services of their children. And here again comes in a conflict of authority with the system of poor-law relief. The

workhouses have already large schools, at which the children of paupers are educated. Should the guardians or the school-board deal with the lowest class of children, or how should the limits of their duties be defined?

These difficulties are suggestive enough of the complexity of the problem. There is no reason to suppose them insuperable, or even to suppose that they are not in the way of being overcome. But it is clear that the school-board has to organize a system of compulsion for which our habits have not in the smallest degree prepared us, and that in so doing they have to encounter not only the prejudices of the parents but the jealousies of numerous religious bodies already in possession of the ground, and ready to contest every inch of the way; and, moreover, to solve a variety of intricate social and economical problems. Meanwhile, public interest in the matter has rather flagged; people are unreasonably disappointed because their unreasonable anticipations were not fulfilled; and there are plenty of parish politicians who are only too ready to get up an agitation against any system which involves a pressure upon the rates. There are loud assertions that the whole thing is a failure, and suggestions that our old comfortable way of letting things alone had its advantages. How far greater results might have been fairly anticipated is a question which I am not qualified to answer; perhaps no one could. It was certainly natural enough to expect some more tangible fruits of two years' legislation; but, on the other hand, the outcry seems to prove that the board is really getting to work at last; and the complaints themselves demonstrate, if there were any necessity for such demonstration, that they have an ample field for labor. This vast disorganized mass of houses presents, of course, the most aggravated case; and it is here more than anywhere that social difficulties have out-run all attempts to grapple with them. It must be a work of many years to bring anything like order out of such a huge fragment of chaos. In other towns the work is apparently further advanced; and we may hope that more real impression is being produced on the appalling masses of ignorance and poverty. Meanwhile, the process must be slow, and moreover a good deal of heat will be generated while it lasts.

One question which seems pretty certain to arise in the next session will probably illustrate the intensity of the religious animosities which at present exhaust themselves chiefly in school-board questions. Mr. Gladstone can hardly avoid longer proposing some settlement of the Irish University question. It is idle to speculate on the nature of the solution which he will propose. He is watched by several parties, whose antipathies are so marked that it will indeed be a feat of statesmanship if he succeeds in removing them all. The Roman Catholics, who insist upon the endowment of their university; the Protestants, who will be scandalized by any kind of concession to Catholicism; the Radicals, who object to any encouragement to the denominational system, whether Catholics or Protestants are to reap the benefit, have the materials for a very pretty triangular duel; and when we consider that the question has to be fought out upon an Irish topic, and is therefore in no danger of being treated with coldness, or confined within strictly logical limits, we may anticipate a lively session. The leaders of both parties have complicated matters by flirtations with the Irish bishops and their opponents which will give ample opportunity for personal recrimination. It is not beyond the bounds of probability that this may be the shoal on which Mr. Gladstone's government will be finally wrecked, in spite of the skill with which he has hitherto frustrated the predictions of his opponents. Such speculations, however, are as yet premature; for we have been treated to no foreshadowings of policy from which the keenest of political prophets could infer the future.—*Correspondence of the Nation.*

JOSH BILLINGS ON SILENCE.

SILENCE iz a still noise.

One ov the hardest things for a man to do, iz to keep still.

Everybody wants tew be heard fust, as this iz jist what fills the world with nonsense.

Everybody wants tew talk, few want to think, and nobody wants to listen.

The greatest talkers among the feathered folks, are the magpie and ginny hen, and neither ov them are of mutch account.

If a man ain't sure he iz right the best kard he kan play iz a blank one.

I have known menny a man tew beat in an argument by just nodding his head once in a while and simply say, "*jess so, jess so.*"

It takes a grate menny blows to drive in a nail, but one will clinch it.

Sum men talk just as a French pony trots, all day long, in a haff bushel meazzure.

Silence never makes enny blunders, and alwuz gits az mutch credit az iz due it, and oftimes more.

When i see a man listening to me cluss i alwuz say to miself, "*look out, Fosh, that fellow iz taking your meazzure.*"

I hav heard men argy a pint two hours and a haff and not git enny further from where they started than a mule in a bark mill, they did a good deal ov going round and round.

I hav sat on jurys and had a lawyer talk the law, fakts and evidence ov the kase all out ov me, besides starting the taps on mi boots.

I hav bin tew church hungry for sum gospel, and cum hum so phull ov it that i couldn't draw a long breth without starting a button.

Brevity and silence are the two grate kards, and next to saying nothing, saying a little, iz the strength ov the game.

One thing iz certain, it iz only the grate thinkers who kan afferd tew be brief, and thare haz been but phew volumes yet published which could not be cut down two-thirds, and menny ov them could be cut clean back to the title page without hurting them.

It iz hard tew find a man ov good sense who kan look back upon enny occasion and wish he had sed sum more, but it iz easy tew find menny who wish they had said less.

A thing sed iz hard tew recall, but unsed it kan be spoken any time.

Brevity iz the child of silence, and iz a great credit tew the old man.

THE AGE OF NIAGARA.

AN element in the problem of Niagara's age is the flow of water. To construct a scale from the present and apply it to the past, we should know that the amount of water in past ages has been essentially the same as now.

About 9,800 cubic miles of water—nearly half the fresh water on the globe—are in the upper lakes, and 18,000,000 cubic feet in this plunge over Niagara Falls every minute; all the water of the lakes making the circuit of the Falls, the St. Lawrence, the ocean, vapor, rain, and lakes again, in 152 years. Through the Illinois Canal about 8,000 cubic feet of water are taken every minute from Lake Michigan to the Illinois River; through the Welland Canal 14,000 cubic feet flow every minute from Lake Erie into Lake Ontario, and through the Erie Canal 30,000 cubic feet pass every minute from the same lake into the Hudson. Thus 52,000 cubic feet of water, which nature would give to Niagara, are diverted every minute by artificial channels, some into the Mexican Gulf and some into the Bay of New York. Add this to 18,000,000, it is as a drop in the bucket, and would make no appreciable difference in the character of the Falls or their rate of recession.—*Popular Science Monthly*.

HOW PENCIL LEADS ARE MADE.

GRAPHITE, clay, and water are the materials used. The finest graphite, after being finely ground, is mixed with a peculiar blue clay, found only in Bavaria, and the whole kneaded with water to the consistency of putty. This mess is placed in a strong cylindrical iron vessel, in the bottom of which is a hole of the diameter of the lead desired. A plunger forces the mixture out through this small opening, which is received on metallic sheets, which, when filled, are placed in an oven for baking. The softness or hardness of the pencil depends upon the degree of hardness to which the baking is carried. The leads are afterward broken up into the sizes required. Nine different sizes of leads are made, and number from 1 to 9.

CORRESPONDENCE.

MR. EDITOR,—I have been exceedingly interested in reading two articles in late numbers of the *EDUCATIONAL MONTHLY*; one upon the "Common Errors of School Histories," and the other on the "Origin of the Names of States." I am greatly obliged to the authors of these papers for the valuable information they have given us. As teachers we cannot be too grateful for any aid in rendering our instruction more exact and critical. I have, however, several points of disagreement from the authors, and will name two or three by way of illustration. All of our United States histories state that in 1622 Gorges and Mason obtained a grant of land lying between the Merrimac, the Kennebec and St. Lawrence rivers, which they called Laconia, and which was afterward divided between them, Mason taking the part lying west of the Piscataqua, calling it New Hampshire, and Gorges the portion lying east, naming it the province of Maine. I have not your article by me, yet I remember that this statement was called in question. I should be glad to know the authority for the contradiction. Bancroft says, (Vol. I, p. 328,) "Gorges and Mason took a patent for Laconia, the whole country between the sea, the St. Lawrence, the Merrimac and the Kennebec (Aug. 10, 1622). Hildreth (Vol. I, p. 168) repeats the assertion. He also says (Vol. I, p. 200) that in "1629 Mason and Gorges had made a partition of their province of Laconia, and Mason had obtained in his own name a new and separate grant for that portion of it between the Merrimac and the Piscataqua, etc. This new province was called New Hampshire." I can quote other and equally definite authorities. Now while they are unanimous and universally accepted, how dare the teacher change our statements except upon the most reliable counter authorities, and is it quite fair to lay the burden of the error—if there be one—on the backs of the school histories when they merely follow Bancroft, Hildreth and other acknowledged historians?

Again, Carolina is said to be named from Charles IX of France. I admit the name was originally applied to Ri-

baut's fort in 1562, at Port Royal, and afterward to Laudonniere's on the St. John. But these settlements were failures, and the first permanent colonies were planted by the English upon the grant given in 1663 to Samuel Clarendon and others by Charles II. The name originally was merely local, i. e., the forts were thus designated. In the patent of 1663 it was formally applied to the territory afterward divided into North and South Carolina, and, being given by Charles II, it is natural to suppose that these States were named after him rather than after a king of France who had been dead over a half of a century when the colonies were established.

With regard to the story of Pocahontas, I only say, *Cui bono?* I confess I have little sympathy with those iconoclasts who run through the records of the past knocking off all their romance and beauty. Suppose the story may possibly be in part a fiction of Smith's, what of that? It does not injure the facts and does make them entertaining. Why is the early history of Virginia better remembered than that of any other State in the Union? I really wish we had as good and harmless a fiction—if it be one—thrown around every great historical event to make it interesting and impress it on our minds. I have read the controversy about the character of Pocahontas, but have felt little inclination to join in the effort to soil the pure and beautiful reputation which the little Indian maiden has acquired. You remember what Washington Irving says of the "Vampires of history?"

I could name other points upon which I disagree, but refrain. I state these not in the spirit of hostile criticism, but merely because in the search after truth we must examine both sides. Your authors seem to have caught a glimpse of a side I have not seen very clearly, and I would like to have it fully exhibited.

Very sincerely yours,

J. DORMAN STEELE.

Elmira, 1872.

THE GERMANS have established no university for the last half-century. Their plan is to strengthen those they have, rather than to found new ones.

A QUESTION FOR GRAMMARIANS.

CARBONDALE, Ill., Nov., 1872.

MR. EDITOR,—To-day my class in "Analysis" met with a difficulty. A young lady, in analyzing the sentence, "*You must study*," called it a simple *declarative* sentence. The objection to this statement was that the sentence could be nothing else than *imperative*.

The ground taken was good. If I, as teacher, had told one of them to study, using the language of the sentence, he or she would have regarded it as a *command*.

I decided that it was declarative, though having the form of a command.

Will your grammatical editor give us his opinion in the EDUCATIONAL MONTHLY?

These discussions arose among Misses just entering their *teens*.

Hoping to see an answer in the MONTHLY, I am, yours truly,

S. H.

CURRENT PUBLICATIONS.

LITERATURE has certainly been favored of late years in the line of various new methods of acquiring the modern languages; all of which, however little or much they may differ in other respects, seem at least to agree in this—that there ought to be and is some easier way of getting hold of a language than the old traditional one of polling over a dictionary, and translating from the foreign into the vernacular. Here is a new book,¹ for instance, by Mr. Woodbury, which claims to be an improvement on his former "New Method of learning to Read, Write and Speak German." Now, what we want in a book of this kind which purports to teach a language, is one of two things: either that it should be a grammar, systematically arranged, with the nouns, adjectives, pronouns and verbs declined and in

¹ A Practical Course with the German Language, by W. H. Woodbury, A. M. New York and Chicago: Ivison, Blakeman, Taylor & Co.

their places, so that we know where to find them, and the rules of syntax also arranged in some order with their lists of exceptions as complete as may be, so that the book can be used for reference as well as for study; or else, that it should ignore the statement of rules as much as possible, and endeavor, on the other hand, to instil into the pupil the genius of the language, by the learning of idioms and the constant repetition of sentences, written and spoken, from German to English, and from English back again into German. To try to unite these two methods in one book is sure to make it cumbersome and to result in incompleteness in both, and this is just the trouble with the volume before us. As a grammar it is unmethodical in the extreme. Fish, flesh and fowl are mixed up into such an indistinguishable pot-pourri, that it is next to impossible for one to find what one wants, even with the aid of the index which is tolerably complete—that is, it would be impossible even if all that one wanted were there, but all that one wants in a grammar is not there, unless one is satisfied with a very incomplete treatise of the language.

On the other hand, as an easy, practical course for beginners in German, it is spoiled by this very grammar which it carries along with it all the way through. It contains too many unnecessary rules in the beginning of the book. The very idea of these learning-made-easy methods is to get the student interested in the language, by starting him on the simplest imaginable sentences where all languages are more or less alike, before initiating him into any of its peculiarities. To specify; there is no need of burdening the pupil's mind at the outset with the three genders, and their various terminations. A better course, in our opinion, is to take up one of the genders first—as Ahn does in his last edition—the masculine, for instance, and keep at that until the learner gets to be familiar with the various masculine terminations in the different cases, and then go on to the feminine and neuter; for after all, one of the most annoying things to the average scholar, in beginning German, is this very subject of gender. And here let us speak of the folly of crowding into a book of this kind such long lists of exceptions and of words of peculiar formation, as we find—opening the book

at random—on the 92d page, where thirty-three feminine nouns are enumerated that add *e* in the plural and take the *umlaut*; and turning over five pages further we have two more lists of nouns, masculine and neuter, of from forty to fifty words apiece, that have some peculiarity about them; and going on a little further yet we come across nearly three entire pages of disconnected words of various kinds. Now for what end is all this? Is it intended that the scholar should commit these to memory? No scholar will do it, and it would do him no good if he did. It is pretty generally agreed upon that there is no way of making oneself master of these forms except by their repeated use in sentences, just wherein this book fails for the simple reason that it is so filled up with other things that it has not room enough for exercises. These lists of words are interesting enough to look over, but so far from forming a necessary part of the book—like the classified nouns occupying from page 271 to 293—they are just so much useless lumber. The English-German as well as German-English vocabulary in the back of the book is a good idea, and saves the learner much unnecessary trouble.

Turning from the book as a whole, we would beg leave to call attention to a few particular points. On p. 18, in the pronunciation of vowels, two sounds are given for *o*; long, as *o* in *no*, and short, as *o* in *not*. This latter is new to us. The short *o* in German, is an altogether different sound from our short *o*, which very nearly resembles the German *a*. In the word *Gott*, for instance, where the *o* is short, the sound is very nearly like *o* in *or*, only shorter, entirely distinct from the *o* in *not*. Again, on the 19th page, in speaking of *b*, *d* and *ng*, the author omits to state that at the end of syllables they are pronounced like *p*, *t* and *nk* respectively; and in the pronunciation of initials *S* and *W*, page 20, we are told that *S* has a sound between our *S* and *Z*, and *W* between our *W* and *V*! As for initial *S*, we challenge the acutest ear to distinguish between the *S*, for instance, in the German word *Sohn* and *Z* in our word *Zone*. The sound is precisely alike in both instances. But what shall we say about that sound between *W* and *V* which the student must acquire before he can hope to pronounce the German *W*? Such a hybrid

among the consonants we have never before been introduced to. Unfortunately the author has given us nothing to follow in striving to catch this nicety of sound, and we are left to to imagine what it may be like. The best of German teachers in Berlin say that *W* is always pronounced like our *V*, even when it immediately follows one or more consonants in the same syllable; and that this adapting it to our *W* sound is an innovation from German Pennsylvania or else a provincialism from Swabia. We beg leave also to call attention to the bungling expression *von zu Hause*, page 71, an exact equivalent of which in English would be *from at home*. In German orthography the author seems to follow no fixed principle at all. Thus he spells Köln sometimes with a *k* and sometimes with a *c*; the word Doctor likewise appears with both a *k* and a *c*; Lexicon is written only with a *c*, not to mention other incongruities.

Aside from these inaccuracies which we have pointed out, the general plan of the book seems to fail in this—that while it loads the student with too many rules, exceptions and vocabularies, in proportion to the number of exercises to render it an easy, practical course, it is not, on the other hand, a sufficiently scientific discussion of the German language to warrant its being very useful as a Grammar of reference.

H. P.

THE INTERNATIONAL SCIENTIFIC SERIES⁽²⁾ is initiated by Dr. Tyndall's "Forms of Water in clouds and rivers, ice and glaciers." The book contains about 200 pages, is well illustrated and is a handy book. Other commendation of its matter, than mentioning its author's name, is quite unnecessary. The "International Scientific Series" is intended to form an elegant and valuable library of popular science, "fresh in treatment, attractive in form, strong in character, moderate in price, and indispensable to all who care for the acquisition of solid and serviceable knowledge." The American author explains that some systematic effort of this kind must be made to counteract the tendency of careless and unscrupulous book-makers who cater to public ignorance and love of the marvellous, and who foist their

(2) D. APPLETON & COMPANY, Publishers.

crude productions upon those who are too little instructed to judge of their real quality.

The same publishers have just begun another series entitled, "Science Primers," edited by Professors Huxley, Roscoe and Balfour Stewart. II is on Chemistry and III is on Physics.

ART EDUCATION, SCHOLASTIC AND INDUSTRIAL, by Walter Smith, State Director of Art Education in Massachusetts, is an elaborate and learned work just from the press of Messrs. James R. Osgood & Co. We shall have occasion from time to time to give our readers extracts from its pages.

PUTNAM'S HANDY BOOK SERIES, so far, has two books issued. The first is "How to Educate yourself, with or without masters." It is prepared by George Cary Eggleston. The second is "Social Economy," by J. E. Thorold Rogers.

E. H. BUTLER & Co.'s NEW AMERICAN SERIES has just been increased by "The Etymological Reader." Its authors claim this book to be the first systematic attempt to associate the study of Etymology with exercises in reading. The fitness of this association need not be questioned.

THE LAWRENCE SPEAKER is a selection of literary gems in prose and poetry, by Philip Lawrence. The compiler claims that this work contains not only the finest productions of authors known to fame, but also a number of anonymous pieces of the highest merit, as well as practical hints and rules to be followed by all in the study of Elocution, as regards articulation, modulation, emphasis and delivery.

EVERY-DAY ERRORS OF SPEECH, by Dr. L. P. Meredith, has just been published by Messrs. J. B. Lippincott & Co.

MESSRS. IVISON, BLAKEMAN, TAYLOR & Co. have published "A General Index to the contents of fourteen popular treatises on Natural Philosophy, for the use of Students, Teachers and Artizans." The work shows much study by the "Massachusetts Teacher" who arranged it.

LIVY, with an interlinear translation, by I. W. Bieber, will be grateful to undergraduates, who are already indebted for similar favors to Mr. Desilver, the publisher.

MR. STANLEY'S BOOK, "How I found Livingston," will soon be ready.

AMONG the recent publications of Messrs. HARPER & BROTHERS we have "California: a book for travelers and settlers," by Charles Nordhoff. It is finely illustrated with maps and engravings.—Another of the "Household Edition" of the works of Charles Dickens—"David Copperfield"—well illustrated.—"The Eustace Diamonds," by Anthony Trollope.—"Little-Folk Life" by Gail Hamilton.—"Song Life for Sunday Schools," by Philip Phillips.—"The Adventures of a Broronie, as told to my child," by the author of "Jchn Halifax, Gentleman," illustrated.

MESSRS. DODD & MEAD have published "Premiums paid to Experience: incidents in my life," by Edward Garrett. Illustrated.—"The Little Sanctuary and other Meditations," by Alexander Raleigh.

PROF. DEVOLSON WOOD'S Treatise on the Construction of Bridges and Roofs, designed as a Text-book, is nearly ready and will be published next month. A new edition of his "Resistance of Materials" is in preparation.

PROF. A. S. PACKARD is writing a "History of Bowdoin College," with which institution he has been connected sixty years.

A MANUAL OF AMERICAN IPEAS is the title of a work by Caspar T. Hopkins, published in San Francisco.

DEXTER SMITH'S new volume on "The Songs and Song Writers of America" is nearly ready.

PROF. TYNDALL, the eminent English scientist, and Prof. J. H. Pepper, author of "The Boy's Play Book of Science," have arrived in this country.

THE ALBUM OF AMERICAN INVENTION is the title of a work intended for the forthcoming Vienna International Exhibition.

THE Pennsylvania Historical Society is just about issuing the "Correspondence between William Penn and James Logan," vol. 2, running from 1700 to 1750.

F. C. BURNAND has produced a burlesque on the classical "History of the Adventures of Sanford and Merton," which is said to be very humorous in its text and comic in illustration.

MISCELLANEA.

AS a proof that education is, even in Russia, on the way to progress, statistics have been forwarded us showing that in the province of Moscow at least one child in ten now enjoys the benefits of an elementary education. It should be remembered that the proportion in highly educated countries is one in six.

THE University of Vermont, which opened its doors to women a little more than a year ago, has now eight female students, two in the Sophomore, and six in the Freshman class.

DON.—In the middle ages the professors of the University of Oxford were called "Dominus," or "Don." In the case of the learned professor whose name is known to scholars as "Duns Scotus," the title was of course conferred, and the opprobrious name, "dunce," came into use somewhere on the *lucus a non lucendo* principle. Hence the common term "dunce."

ENGLISH noblemen still cherish the conviction that Americans are a race of savages. One of them, on being introduced to Clara Louise Kellogg, innocently queried, "Do you speak English?"

PUBLISHERS' DEPARTMENT.

THE Contents for this Volume of the AMERICAN EDUCATIONAL MONTHLY will be mailed to subscribers when applied for.

OMAHA.—The Board of Education of Omaha, Neb., has recently adopted and introduced into the public schools of that city, McGuffey's Reader and Speller, the Eclectic Geography, White's Arithmetics, Harvey's Grammar, and Venable's U. S. History.

WITHOUT doubt the most popular history ever published for school purposes is Anderson's Grammar School United States History. It is very extensively used all over the country, for the reason that teachers find it contains exactly what they want to teach arranged in a teachable shape.

The publishers, CLARK & MAYNARD, New York, announce that they will send, post-free, a copy of the book to any Superintendent or Principal of a Graded School who will send to them address with his course of study.

SPECIAL RATES TO TEACHERS.—On another page will be found the prospectus of two periodicals which are very important to Teachers.

The Phenological Journal, which is well known and contains much information of importance to TEACHERS on the subject of the classification and government of *pupils*. It is published monthly at \$3.00 a year, and supplied to Teachers at *Club rates*, \$2.00 a year. The Science of Health is a new magazine just closing its second volume. We need hardly call the attention of Teachers to the great importance of the subject to which it is devoted. A thorough knowledge of the *Laws of Life and Health* must be of incalculable value to every Teacher. THE SCIENCE OF HEALTH will contain a series of articles on Popular Physiology, amply illustrated with all the latest facts on the subject. Also, a series of articles on each system of Medicine, together with a great amount of valuable information on its speciality. Published monthly at \$2.00 a year. Teachers supplied at \$1.25.

An Agent is wanted in every school district. Address all letters to S. R. WELLS, Publisher, 389 Broadway, New York.

